

AD-A059 077

AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB OHIO F/8 11/7
TOXICOLOGICAL TESTING OF SELECTED HAZARDOUS MATERIALS FOR TRANS--ETC(U)
APR 76 K C BACK, A A THOMAS, J D MACEWEN DOT-AS-40079

UNCLASSIFIED

AMRL-TR-78-70

DOT/MTB/OHIO-76/3

NL

1 of 1

50
2025-11-17

END

DATE

TIME

11-78

DDC

Report No. DOT/MTB/OHMO-76/3

LEVEL

1

TOXICOLOGICAL TESTING OF SELECTED HAZARDOUS MATERIALS FOR TRANSPORTATION PURPOSES

K.C. Back
A.A. Thomas
J.D. MacEwen



APRIL 1976
INTERIM REPORT

DDC
RECEIVED
E

U.S. DEPARTMENT OF TRANSPORTATION
Materials Transportation Bureau
Office of Hazardous Materials Operations

Washington, D.C. 20590

78

00

AD-A059077

NOTICE

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policy of the Department of Transportation. This report does not constitute a standard, specification or regulation.

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

1. Report No. DOT/MTB/OHMO-76/3	2. Government Accession No.	3. Recipient's Catalog No.		
4. Title and Subtitle Toxicological Testing of Selected Hazardous Materials for Transportation Purposes.	5. Report Date April 1976	6. Performing Organization Code		
7. Author(s) K. C. Back, A. A. Thomas and J. D. MacEwen*	8. Performing Organization Report No. AMRL-TR-78-70			
9. Performing Organization Name and Address 6570th Aerospace Medical Research Laboratory (AFSC), Wright-Patterson AFB, Ohio 45433 (*Toxic Hazards Research Unit, Dept. of Community and Environmental Medicine, University of Calif., Irvine--a contractor to the Air Force	10. Work Unit No. (FAIS)	11. Contract or Grant No. DOT-AS-40079		
12. Sponsoring Agency Name and Address Office of Hazardous Materials Operations, Materials Transportation Bureau, Department of Transportation, Washington, D.C. 20590	13. Type of Report and Period Covered Interim Report July 1974-March 1976	14. Sponsoring Agency Code		
15. Supplementary Notes				
16. Abstract A number of organic chemicals were subjected to selected toxicological tests prescribed for classification purposes in the Department of Transportation Hazardous Materials regulations. Some of these materials were also examined for skin corrosivity. Aqueous solutions of several common inorganic acids and bases were tested to establish dividing line between corrosive and non-corrosive concentrations. Test results are reported.				
<table border="1"> <tr> <td> 17. Key Words Hazardous materials, Transportation, Toxicological tests, skin corrosion, dermal toxicity, inhalation toxicity, oral toxicity. </td> <td> 18. Distribution Statement Document is available to the public through the National Technical Information Service, Springfield, Va. 22151 </td> </tr> </table>			17. Key Words Hazardous materials, Transportation, Toxicological tests, skin corrosion, dermal toxicity, inhalation toxicity, oral toxicity.	18. Distribution Statement Document is available to the public through the National Technical Information Service, Springfield, Va. 22151
17. Key Words Hazardous materials, Transportation, Toxicological tests, skin corrosion, dermal toxicity, inhalation toxicity, oral toxicity.	18. Distribution Statement Document is available to the public through the National Technical Information Service, Springfield, Va. 22151			
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages		
		22. Price		

TOXICOLOGICAL TESTING OF SELECTED HAZARDOUS MATERIALS FOR TRANSPORTATION PURPOSES

A series of acute toxicity studies were conducted on industrial chemicals under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory. These studies were conducted by the Toxic Hazards Research Unit of the Department of Community and Environmental Medicine of the University of California, Irvine. The information obtained in these studies was used to classify these compounds into categories which might help define shipping and handling requirements related to the acute toxicity hazard associated with each chemical compound. The materials were classified according to a system described in Department of Transportation Report No. TES-20-72-3. The classification system used is shown below:

	<u>Extremely Toxic</u>	<u>Highly Toxic</u>	<u>Toxic</u>
Inhalation, 1 Hour LC ₅₀	500 mg/m ³ or less (50 ppm or less)	>500-2000 mg/m ³ (>50-200 ppm)	>2000-200,000 mg/m ³ (>200-20,000 ppm)
Oral, 14-Day Single Dose LC ₅₀	5 mg/Kg or less	>5-50 mg/Kg	>50-5000 mg/Kg
Skin Absorption (Dermal) LD ₅₀	20 mg/Kg or less	>20-200 mg/Kg	>200-20,000 mg/Kg

Since the new classifications were based solely on acute toxicity, all forms of a material (concentrates, solutions, mixtures, etc.) have been assigned to the same toxicity categories regardless of concentration of the active ingredients. No consideration was given to hazard potential of the materials reclassified. For purposes of uniformity all inhalation toxicity data was converted to mg/m³ if given in other units of measurement. These values may be converted to parts per million by use of the following formula:

$$\text{ppm} = \frac{24.50 \times \text{mg/m}^3}{\text{mol. wt.}}$$

Conversion of units from mg/m³ to ppm may, in certain instances change the classification in which borderline compounds may fall. In those instances where this happens the mg/m³ unit should take precedence.

Toxicity data sheets are presented in Appendix A for all compounds on which requested studies are complete. Each compound has been assigned a code number and the data are presented in numerical order using the coded system.

For a number of compounds the only determination requested by the Department of Transportation was skin corrosion which cannot be used for toxicity classification. Therefore, data sheets could not be prepared and the results of these studies are presented in Table 1 which include all material examined in this manner. The classification of the compounds studied is shown in Table 2. Information concerning the source, lot number and purity or grade of the individual compounds is given in Appendix B.

The test results reported herein are only for those materials actually tested and should not be assumed to represent all materials of the same generic name, because different raw materials and processing may result in variation as to purity of the substance and the nature of impurities.

Table 1. Corrosiveness of DOT Selected Compounds on Albino Rabbit Skin

Code	Compound	1	2	3	4	5	6	Result
107	Perchloromethylmercaptan	0	0	0	0	0	0	Noncorrosive
165	Ethyl Chloroformate	0	0	0	0	0	-	Noncorrosive
180	Methyl Chloroformate	0	0	0	0	0	-	Noncorrosive
183	Nitric Acid, Aq. Sol.	0	+	0	0	0	+	Corrosive
	Nitric Acid, Aq. Sol.	0	0	0	0	0		Noncorrosive
	Nitric Acid, Aq. Sol.	0	0	0	0	0		Noncorrosive
251	Phenol, Solid	+	+	-	-	-	-	Corrosive
252	Propionic Acid, Aq. Sol.	0	0	0	0	0	-	Noncorrosive
	Propionic Acid, Aq. Sol.	0	0	0	0	0	-	Noncorrosive
253	Hydrochloric Acid, Solution	+	+	-	-	-	-	Corrosive
	Hydrochloric Acid, Solution	0	+	0	+	-	-	Corrosive
	Hydrochloric Acid, Solution	+	0	0	0	0	0	Noncorrosive
	Hydrochloric Acid, Solution	0	0	0	0	0	-	Noncorrosive
	Hydrochloric Acid, Solution	0	0	0	0	0	-	Noncorrosive
	Hydrochloric Acid, Solution	0	0	0	0	0	-	Noncorrosive
	Hydrochloric Acid, Solution	0	0	0	0	0	-	Noncorrosive
	Hydrochloric Acid, Solution	0	0	0	0	0	-	Noncorrosive
	Hydrochloric Acid, Solution	0	0	0	0	0	-	Noncorrosive
	Hydrochloric Acid, Solution	0	0	0	0	0	-	Noncorrosive
	Hydrochloric Acid, Solution	0	0	0	0	0	-	Noncorrosive
	Hydrochloric Acid, Solution	0	0	0	0	0	-	Noncorrosive

Code	Compound	1	2	3	4	5	6	Result
254	Sodium Hydroxide, Solution	+	+	+	0	-	-	Corrosive
	Sodium Hydroxide, Solution	+	0	0	+	+	-	Corrosive
	Sodium Hydroxide, Solution	0	0	0	0	0	-	Noncorrosive
	Sodium Hydroxide, Solution	0	0	0	0	0	-	Noncorrosive
	Sodium Hydroxide, Solution	0	0	0	0	0	-	Noncorrosive
255	Sulfuric Acid, Aq. Solution	0	0	0	0	0	-	Noncorrosive
	Sulfuric Acid, Aq. Solution	0	0	0	0	0	-	Noncorrosive
	Sulfuric Acid, Aq. Solution	0	0	0	0	0	-	Noncorrosive
256	Hydrofluoric Acid, Aq. Solution	0	0	0	0	0	-	Noncorrosive
	Hydrofluoric Acid, Aq. Solution	0	0	0	0	0	-	Noncorrosive
	Hydrofluoric Acid, Aq. Solution	0	0	0	0	0	-	Noncorrosive
258	Cresol (Coal Tar)	+	+	-	-	-	-	Corrosive
259	Cresol (Petroleum)	+	0	+	+	+	+	Corrosive
260	o-Cresol, Practical	+	+	-	-	-	-	Corrosive
261	m-Cresol, Practical	+	+	-	-	-	-	Corrosive
262	p-Cresol, Practical	+	+	-	-	-	-	Corrosive
263	Sodium Trichloro-s-triazinetrione	0	0	0	0	0	-	Noncorrosive

Code	Compound	1	2	3	4	5	6	Result
264	Fumaric Acid	0	0	0	0	0	-	Noncorrosive
265	Maleic Anhydride	+	0	+	+	-	-	Corrosive
266	Ammonium Hydroxide 20%	+	+	-	-	-	-	Corrosive
	Ammonium Hydroxide 15%	0	+	0	0	0	+	Corrosive
	Ammonium Hydroxide 12%	+	+	-	-	-	-	Corrosive
	Ammonium Hydroxide 10%	0	0	+	0	0	0	Noncorrosive
	Ammonium Hydroxide 5%	0	0	0	0	0	-	Noncorrosive
	Ammonium Hydroxide 1%	0	0	0	0	0	-	Noncorrosive
267	Oxalic Acid	0	0	0	0	0	-	Noncorrosive
268	Sodium Sulfide, Aq. Solution 26%	+	+	-	-	-	-	Corrosive
269	Sodium Sulfhydrate, Aq. Solution 45%	+	+	-	-	-	-	Corrosive
270	3-Methylbutyric Acid	0	0	0	0	0	-	Noncorrosive
271	Tris-2-Hydroxyethylisocyanurate	0	0	0	0	0	0	Noncorrosive
273	p-Cresol, 98+% (Sherwin-Williams)	+	+	-	-	-	-	Corrosive
274	Potassium Hydroxide, Aq. Solution 4%	+	+	-	-	-	-	Corrosive
	Potassium Hydroxide, Aq. Solution 2%	+	+	-	-	-	-	Corrosive
	Potassium Hydroxide, Aq. Solution 1%	0	0	0	0	0	0	Noncorrosive

Code	Compound	1	2	3	4	5	6	Result
275	Acetic Acid, Aq. Solution	0	0	0	0	0		Noncorrosive
	Acetic Acid, Aq. Solution	0	0	0	0	0		Noncorrosive
	Acetic Acid, Aq. Solution	0	0	0	0	0		Noncorrosive
	Acetic Acid, Aq. Solution	0	0	0	0	0		Noncorrosive
286-a	Carburetor Cleaner "Pennzoil Gumout"	0	0	0	0	0		Noncorrosive
286-b	Carburetor Cleaner "DuPont No. 7 Carburetor Cleaner"	0	0	0	0	0		Noncorrosive
286-c	Carburetor Cleaner "Berryman B-12 Chemtool"	0	0	0	0	0		Noncorrosive
288	Chromic Nitrate	0	0	0	0	0		Noncorrosive
289	Calcium Chromate	0	0	0	0	0		Noncorrosive

+ = Caused visible destruction or irreversible alteration in skin tissue after 4 hours contact.

o = Did not cause visible destruction or irreversible alteration in skin tissue after 4 hours contact.

- = Not tested, a positive of 2/6 or 0/5 has already been produced.

Table 2. Classification of Compounds Based on Acute Toxicity Tests

<u>Code Number</u>	<u>Compound</u>	<u>Toxicity Classification</u>
107	Perchloromethylmercaptan	Extremely Toxic
143	Boron Trichloride	Toxic
144	Boron Trifluoride	Highly Toxic
165	Ethyl Chloroformate	Highly Toxic
170	Hexamethylene Diamine	Toxic
180	Methyl Chloroformate	Highly Toxic
248	n-Butyl Acrylate	Below Toxic
249	Methyl Acrylate	Below Toxic
250	Monoethanolamine	Toxic
251	Phenol (Solid)	Toxic
257	Ethyl Mercaptan	Below Toxic
258	Cresol (Coal Tar)	Toxic
259	Cresol (Petroleum)	Toxic
260	o-Cresol	Toxic
261	m-Cresol	Toxic
262	p-Cresol	Toxic
263	Sodium Trichloro-s-Triazineurione	Toxic
264	Fumaric Acid	Below Toxic
265	Maleic Anhydride	Toxic
267	Oxalic Acid, 5%	Toxic
270	3-Methylbutyric Acid	Toxic
271	Tris-2-Hydroxyethylisocyanurate	Toxic
273	p-Cresol (Sherwin Williams)	Highly Toxic
285	Nitrogen Trifluoride	Toxic
287	Phosphotungstic Acid	Toxic
291	Silicon Tetrafluoride	Toxic

APPENDIX A
DATA SHEETS

TOXICITY DATA SHEET

COMPOUND: PERCHLOROMETHYLMERCAPTAN

CODE: 107

CLASSIFICATION: EXTREMELY TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
male	84 (11)	1-Hr.	
Rat female	122 (16)	LC50	
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	1782	LD50	
2.	Rabbit	Dermal	-	Noncorrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³. Parenthetical values are ppm.

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

107

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 1-Hour LC₅₀: Male = 84 mg/m³
 95% confidence limits (74-97) or 11 ppm
 10-13 ppm

Female = 122 mg/m³
 95% confidence limits (99-168) or 16 ppm
 18-22 ppm

Rabbit 14-Day Dermal LD₅₀: 1782 mg/kg
 (24 Hour Skin Contact) 95% confidence limits (938-3384)

Perchloromethylmercaptan was found to be noncorrosive to intact rabbit skin.

Data fall in "Extremely Toxic" category.

ACUTE INHALATION TOXICITY OF PERCHLOROMETHYLMERCAPTAN TO RATS

<u>ppm</u>	<u>Male</u>	<u>Mortality Ratio</u>	<u>ppm</u>	<u>Female</u>	<u>Mortality Ratio</u>
16.9		5/5	43		5/5
14.0		3/5	31		5/5
11.2		4/5	28		4/5
10.8		2/5	20		2/5
9.0		1/5	16		3/5
7.0		0/5	10		1/5

ACUTE DERMAL TOXICITY OF PERCHLOROMETHYLMERCAPTAN TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
2000	2/3
1000	1/3
500	0/3

TOXICITY DATA SHEET

COMPOUND: BORON TRICHLORIDE

CODE: 143

CLASSIFICATION:

TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
male	12,197(2541)	1-Hr.	
Rat female	21,266(4418)	LC50	
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.					
2.					
3.					
4.					
5.					
6.					

* Concentration in mg/M³. Parenthetical values are ppm.

** System for expression of toxicity

***Dose in mg/kg

JUSTIFICATION:

143

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 1-Hour LC₅₀:

Male = 12,197 mg/m³
95% confidence limits (10,750-13,780) or 2541 ppm
2243-2878 ppm

Female = 21,266 mg/m³
95% confidence limits (18,880-23,750) or 4418 ppm
3940-4953 ppm.

Data fall in "Toxic" category.

ACUTE INHALATION TOXICITY OF BORON TRICHLORIDE TO RATS

<u>ppm</u>	<u>Male</u> <u>Mortality Ratio</u>	<u>ppm</u>	<u>Female</u> <u>Mortality Ratio</u>
3742	5 5	5201	4 5
3717	4 5	4370	3 5
3019	4 5	4092	0 5
2627	5 5	3792	2 5
2270	1 5	3443	1 5
2032	1 5	2844	0 5

TOXICITY DATA SHEET

COMPOUND: BORON TRIFLUORIDE

CODE: 144

CLASSIFICATION: HIGHLY TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
male	107 (387)	1-Hour	
Rat female	103 (371)	LC50	
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.					
2.					
3.					
4.					
5.					
6.					

* Concentration in mg/M³. Parenthetical values are ppm.

** System for expression of toxicity

*** Dose in mg/Kg

JUSTIFICATION:

144

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 1-Hour LC₅₀: Male = 1076 mg/m³
 95% confidence limits (890-1298) or 387 ppm
 320-467 ppm

Female = 1031 mg/m³
 95% confidence limits (815-1304) or 371 ppm
 293-469 ppm

Data fall in "Highly Toxic" category.

ACUTE INHALATION TOXICITY OF BORON TRIFLUORIDE TO RATS

<u>ppm</u>	<u>Male</u> <u>Mortality Ratio</u>	<u>ppm</u>	<u>Female</u> <u>Mortality Ratio</u>
675	5/5	864	5/5
513	3/5	723	5/5
437	3/5	650	3/5
398	4/5	557	3/5
317	1/5	468	4/5
		399	3/5
		312	3/5
		290	0/5
		266	2/5

TOXICITY DATA SHEET

COMPOUND: ETHYL CHLOROFORMATE
(Ethyl Chlorocarbonate)

CODE: 165

CLASSIFICATION: HIGHLY TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
male	640 (145)	1-11r.	
Rat female	728 (165)	LC50	
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
male	467	LD50	
Rat female	268	LD50	
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	7120	LD50	
2.	Rabbit	Dermal	-	Noncorr.	
3.					
4.					
5.					
6.					

* Concentration in mg/M³. Parenthetical values are ppm.

** System for expression of toxicity

*** Dose in mg/Kg

JUSTIFICATION:

165

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 1-Hour LC₅₀: Male = 640 mg/m³
 95% confidence limits (609-671) or 145 ppm
 138-152 ppm

Female = 728 mg/m³
 95% confidence limits (654-813) or 165 ppm
 148-184 ppm

Rat Oral LD₅₀: Male = 467 mg/kg
 (Single Dose) 95% confidence limits (313-690)

Female = 268 mg/kg
 95% confidence limits (181-396)

Rabbit 14-Day Dermal LD₅₀: 7120 mg/kg
 (24-Hour Skin Contact) Confidence limits could not be calculated.

Ethyl chloroformate was found to be noncorrosive to intact rabbit skin.

Inhalation data fall in "Highly Toxic" category.

ACUTE INHALATION TOXICITY OF ETHYL CHLOROFORMATE TO RATS

<u>ppm</u>	<u>Male</u> <u>Mortality Ratio</u>	<u>ppm</u>	<u>Female</u> <u>Mortality Ratio</u>
152	4/5	184	4/5
138	1/5	148	1/5
117	0/5	118	0/5
101	0/5		

ACUTE ORAL TOXICITY OF ETHYL CHLOROFORMATE TO RATS

<u>Male</u>		<u>Female</u>	
<u>Dose (mg kg)</u>	<u>Mortality Ratio</u>	<u>Dose (mg kg)</u>	<u>Mortality Ratio</u>
1000	5 5	500	5 5
500	3 5	250	2 5
250	0 5	125	0 5

ACUTE DERMAL TOXICITY OF ETHYL CHLOROFORMATE TO RABBITS

<u>Dose (mg kg)</u>	<u>Mortality Ratio</u>
8000	3 3
6350	0 3
5040	0 3

TOXICITY DATA SHEET

COMPOUND: HEXAMETHYLENE DIAMINE
(1,6-Hexanediamine)

CODE: 170

CLASSIFICATION TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
male	Saturated	No	
Rat female	Vapor	Deaths	
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE. ***	SYS. **	REF.
Man			
male	800	LD50	
Rat female	746	LD50	
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	1114	LD50	
2.					
3.					
4.					
5.					
6.					

Concentration in mg/M³

* System for expression of toxicity

*** Dose in mg/Kg

JUSTIFICATION:

170

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 1-Hour LC₅₀: Could not be calculated. Male and female rats exposed for 1 hour to saturated vapors of hexamethylene diamine survived the 14-day postexposure observation period.

Rat Oral LD₅₀: Male = 800 mg/kg
95% confidence limits (472-1357)
Female = 746 mg/kg
95% confidence limits (505-1104)

Rabbit 14-Day Dermal LD₅₀: 1114 mg/kg
(24-Hour Skin Contact) 95% confidence limits (600-2115)

Data fall in "Toxic" category.

ACUTE ORAL TOXICITY OF HEXAMETHYLENE DIAMINE TO RATS

Male		Female	
<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>	<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
1600	5/5	1600	5/5
800	2/5	800	3/5
400	1/5	400	0/5

ACUTE DERMAL TOXICITY OF HEXAMETHYLENE DIAMINE TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
2500	3/3
1250	2/3
625	0/3

TOXICITY DATA SHEET

COMPOUND: METHYL CHLOROFORMATE
(Methyl chlorocarbonate)

CODE: 180

CLASSIFICATION: HIGHLY TOXIC

INHALATION TOXICITY

SPECIES	CONC.*	SYS.**	REF.
Man			
male	342 (88)	1-Hr.	
Rat female	401 (103)	LC ₅₀	
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE***	SYS.**	REF.
Man			
male	187	LD ₅₀	
Rat female	107	LD ₅₀	
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE***	SYS.**	REF.
1.	Rabbit	Dermal	7120	LD ₅₀	
2.	Rabbit	Dermal	-	Noncorr.	
3.					
4.					
5.					
6.					

* Concentration in mg/M³. Parenthetical values are ppm.

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

180

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat 1-Hour LC₅₀: Male = 342 mg/m³
95% confidence limits (249-478) or 88 ppm (64-123 ppm)
Female = 401 mg/m³
95% confidence limits (350-460) or 103 ppm (90-118 ppm)

Rat Oral LD₅₀: Male = 187 mg/kg
(Single Dose) 95% confidence limits (126-276)
Female = 107 mg/kg
95% confidence limits (73-159)

Rabbit 14-Day Dermal LD₅₀: 7120 mg/kg
(24-Hour Skin Contact) Confidence limits could not be calculated.

Methylchloroformate was found to be noncorrosive to rabbit skin.

Data fall in "Highly Toxic" category.

ACUTE INHALATION TOXICITY OF METHYL CHLOROFORMATE TO RATS

<u>ppm</u>	<u>Male</u>	<u>Mortality Ratio</u>	<u>ppm</u>	<u>Female</u>	<u>Mortality Ratio</u>
101		5/5	128		4/5
92		2/5	120		4/5
78		0/5	110		3/5
42		1/5	97		2/5

ACUTE ORAL TOXICITY OF METHYL CHLOROFORMATE TO RATS

Male		Female	
<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>	<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
400	5/5	200	5/5
200	3/5	100	2/5
100	0/5	50	0/5

ACUTE DERMAL TOXICITY OF METHYL CHLOROFORMATE TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
8000	3/3
6380	0/3
5040	0/3

TOXICITY DATA SHEET

COMPOUND: n-BUTYL ACRYLATE

CODE: 248

CLASSIFICATION: BELOW TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
male	32,325(360)	Partial	
Rat female	26,724(5100)	Lethality	
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
male	6169	LD ₅₀	
Rat female	4921	LD ₅₀	
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	5657	LD ₅₀	
2.					
3.					
4.					
5.					
6.					

* Concentration in mg/M³. Parenthetical values are ppm.

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

248

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

One hour inhalation exposures to near saturated vapor concentration produced only partial mortality in male and female rats observed for 14 days postexposure. A concentration of 32,325 mg/m³ (6360 ppm) killed 2 of 5 male rats and a vapor concentration of 26,724 mg/m³ (5100 ppm) resulted in deaths of 4 of 5 female rats exposed. Because of this very low toxic response it was not possible to obtain LC₅₀ values for n-butyl acrylate.

Rat Oral LD₅₀: Male - 6190 mg/kg
(Single Dose) 95% confidence limits (4567-8332)

Female - 4921 mg/kg
95% confidence limits (4321-5604)

Rabbit 14-Day Dermal LD₅₀: 5657 mg/kg
(24 Hour Skin Contact) 95% confidence limits (1451-22,050)

Data fall in "Below Toxic" category.

ACUTE ORAL TOXICITY OF n-BUTYL ACRYLATE TO RATS

<u>Dose (mg kg)</u>	<u>Male</u>	<u>Dose (mg kg)</u>	<u>Female</u>
	<u>Mortality Ratio</u>		<u>Mortality Ratio</u>
8000	4 5	6350	5 5
4000	0 5	5040	3 5
2000	0 5	4000	0 5

ACUTE DERMAL TOXICITY OF n-BUTYL ACRYLATE TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
8000	2/3
4000	1/3
1000	0/3

TOXICITY DATA SHEET

COMPOUND: METHYL ACRYLATE

CODE: 249

CLASSIFICATION. BELOW TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man	_____	_____	_____
Rat	See Justification Section		
Mouse	_____	_____	_____
Dog	_____	_____	_____
Monkey	_____	_____	_____
Other	_____	_____	_____

ORAL TOXICITY

SPECIES	DOSE***	SYS. **	REF.
Man	_____	_____	_____
Rat	_____	_____	_____
Mouse	_____	_____	_____
Dog	_____	_____	_____
Monkey	_____	_____	_____
Cat	_____	_____	_____
Guinea Pig	_____	_____	_____
Other	_____	_____	_____

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE***	SYS. **	REF.
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____

* Concentration in mg/M³

** System for expression of toxicity

*** Dose in mg/Kg

JUSTIFICATION:

249

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

One hour inhalation exposures to near saturated vapors of methyl acrylate caused only partial mortality in albino rats. Because of the low toxicity it was not possible to determine a 14-day LC₅₀ for one hour exposures. One male rat of five died after exposure to 33,238 ppm and 3 of 5 female rats succumbed to 34,315 ppm.

Data fall in "Below Toxic" category.

TOXICITY DATA SHEET

COMPOUND: MONOETHANOLAMINE
(Ethanolamine)

CODE: 250

CLASSIFICATION: T O X I C

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
Rat male	1970	LD50	
Rat female	1715	LD50	
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.					
2.					
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

*** Dose in mg/Kg

JUSTIFICATION:

250

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat Oral LD₅₀: Males 1970 mg/kg
(Single Dose) 95% confidence limits (1431-2712)

 Females 1715 mg/kg
 95% confidence limits (1159-2537)

Data fall in "Toxic" category.

TOXICITY DATA SHEET

COMPOUND: PHENOL
(Solid)

CODE: 251

CLASSIFICATION: T O X I C

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE***	SYS. **	REF.
1.	Rabbit	Dermal	1403	LD50	
2.	Rabbit	Dermal		Corrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

251

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rabbit 14-Day Dermal LD₅₀: 1403 mg/kg
(24-Hour Skin Contact) 95% confidence limits (739-2665)

Phenol was found to be corrosive to rabbit skin.

Data fall in "Toxic" category.

ACUTE DERMAL TOXICITY OF PHENOL TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
2500	3/3
1250	1/3
625	0/3

TOXICITY DATA SHEET

COMPOUND: ETHYL MERCAPTAN
(Ethanethiol)

CODE: 257

CLASSIFICATION: BELOW TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat	See Justification Section		
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.					
2.					
3.					
4.					
5.					
6.					

- * Concentration in mg/M³
 ** System for expression of toxicity
 *** Dose in mg/Kg

JUSTIFICATION:

257

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

One hour inhalation exposures of rats to ethyl mercaptan at concentrations below the lower explosive limit did not cause mortality. At 28,400 ppm 5 male rats survived a 1-hour exposure and at 27,700 ppm 3 of 5 female rats died during exposure.

Data fall in "Below Toxic" category.

TOXICITY DATA SHEET

COMPOUND: CRESOL
(From Coal Tar)

CODE: 258

CLASSIFICATION: TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE***	SYS. **	REF.
1.	Rabbit	Dermal	2000	LD50	
2.	Rabbit	Dermal	-	Corrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

258

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rabbit 14-Day Dermal LD₅₀: 2000 mg/kg
(24-Hour Skin Contact) 95% confidence limits (1470-5860)

Cresol derived from coal tar was found to be corrosive to intact rabbit skin.

Data fall in "Toxic" category.

ACUTE DERMAL TOXICITY OF CRESOL (COAL TAR) TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
4000	3/3
2000	1/3
1000	1/3

TOXICITY DATA SHEET

COMPOUND: CRESOL
(From Petroleum)

CODE: 259

CLASSIFICATION: T O X I C

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man	_____	_____	_____
Rat	_____	_____	_____
Mouse	_____	_____	_____
Dog	_____	_____	_____
Monkey	_____	_____	_____
Other	_____	_____	_____

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man	_____	_____	_____
Rat	_____	_____	_____
Mouse	_____	_____	_____
Dog	_____	_____	_____
Monkey	_____	_____	_____
Cat	_____	_____	_____
Guinea Pig	_____	_____	_____
Other	_____	_____	_____

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	2000	LD ₅₀	
2.	Rabbit	Dermal	-	Corrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

*** Dose in mg/Kg

JUSTIFICATION:

259

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rabbit 14-Day Dermal LD₅₀: 2000 mg/kg
(24-Hour Skin Contact) 95% confidence limits (750-5400)

Cresol derived from petroleum was found to be corrosive to intact rabbit skin.

Data fall in "Toxic" category.

ACUTE DERMAL TOXICITY OF CRESOL (FROM PETROLEUM)
TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
4000	3/3
2000	1/3
1000	1/3

TOXICITY DATA SHEET

COMPOUND: o-CRESOL, PRACTICAL

CODE: 260

CLASSIFICATION: T O X I C

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	891	LD ₅₀	
2.	Rabbit	Dermal	-	Corrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

*** Dose in mg/Kg

JUSTIFICATION:

260

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rabbit 14-Day Dermal LD₅₀: 891 mg/kg
(24-Hour Skin Contact) 95% confidence limits (460-1690)

o-Cresol was found to be corrosive to intact rabbit skin.

Data fall in "Toxic" category.

ACUTE DERMAL TOXICITY OF o-CRESOL TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
2000	3/3
1000	2/3
500	0/3

TOXICITY DATA SHEET

COMPOUND: m-CRESOL, PRACTICAL

CODE: 261

CLASSIFICATION. TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE***	SYS. **	REF.
1.	Rabbit	Dermal	2830	LD50	
2.	Rabbit	Dermal	-	Corrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

261

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rabbit 14-Day Dermal LD₅₀: 2830 mg/kg
(24-Hour Skin Contact) 95% confidence limits could not be calculated.

m-Cresol was found to be corrosive to intact rabbit skin.

Data fall in "Toxic" category.

ACUTE DERMAL TOXICITY OF m-CRESOL TO RABBITS

<u>Dose (mg kg)</u>	<u>Mortality Ratio</u>
4000	3/3
2000	0/3
1000	0/3

TOXICITY DATA SHEET

COMPOUND: p-CRESOL

CODE: 262

CLASSIFICATION: TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE***	SYS. **	REF.
1.	Rabbit	Dermal	222	LD50	
2.	Rabbit	Dermal	-	Corrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

262

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rabbit 14-Day Dermal LD₅₀: 222 mg/kg
(24-Hour Skin Contact) 95% confidence limits (117-422)

p-Cresol was found to be corrosive to intact rabbit skin.

Data fall in "Toxic" category.

ACUTE DERMAL TOXICITY OF p-CRESOL TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
2000	3/3
1000	3/3
500	3/3
250	1/3

TOXICITY DATA SHEET

COMPOUND: SODIUM TRICHLORO-s-TRIAZINETRIONE CODE: 263

CLASSIFICATION. T O X I C

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE***	SYS. **	REF.
Man			
male	406	LD50	
Rat female	466	LD50	
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE***	SYS. **	REF.
1.	Rabbit	Dermal	20,000	Not Lethal	
2.	Rabbit	Dermal	-	Noncorrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

263

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat Oral LD₅₀: Male - 406 mg/kg
(Single Dose) 95% confidence limits (295-559)

Female - 466 mg/kg
95% confidence limits (315-690)

Rabbit 14-Day Dermal LD₅₀: Could not be calculated. No deaths occurred after (24-Hour Skin Contact) skin exposure to 20 g/kg dose.

Sodium trichloro-s-triazinetriene was found to be noncorrosive to intact rabbit skin.

Data fall in "Toxic" category.

ACUTE ORAL TOXICITY OF SODIUM TRICHLORO-s-TRIAZINETRIONE TO RATS

Male		Female	
<u>Dose (mg kg)</u>	<u>Mortality Ratio</u>	<u>Dose (mg kg)</u>	<u>Mortality Ratio</u>
1000	5/5	1000	5/5
500	4/5	500	3/5
250	0/5	250	0/5

TOXICITY DATA SHEET

COMPOUND: FUMARIC ACID

CODE: 264

CLASSIFICATION: BELOW TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE***	SYS. **	REF.
Man			
male	10,720	LD50	
Rat female	9,330	LD50	
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE***	SYS. **	REF.
1.	Rabbit	Dermal	20,000	Not Lethal	
2.	Rabbit	Dermal	-	Noncorrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

*** Dose in mg/Kg

JUSTIFICATION:

264

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat Oral LD₅₀: Male - 10,720 mg/kg
(Single Dose) 95% confidence limits (7,250-15,858)

Female - 9,330 mg/kg
95% confidence limits (6,308-13,800)

Rabbit 14-Day Dermal LD₅₀: Could not be calculated. No deaths occurred after (24-Hour Skin Contact) skin exposure to 20 g/kg dose.

Fumaric Acid was found to be noncorrosive to intact rabbit skin.

Data fall in "Below Toxic" category.

ACUTE ORAL TOXICITY OF FUMARIC ACID TO RATS

<u>Male</u>		<u>Female</u>	
<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>	<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
20,000	5/5	20,000	5/5
10,000	2/5	10,000	3/5
5,000	0/5	5,000	0/5

TOXICITY DATA SHEET

COMPOUND: MALEIC ANHYDRIDE

CODE: 265

CLASSIFICATION: TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	2620	LD50	
2.	Rabbit	Dermal	-	Corrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

*** Dose in mg/Kg

JUSTIFICATION:

265

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rabbit 14-Day Dermal LD₅₀: 2620 mg/kg
(24-hour skin contact) 95% confidence limits (1930-3550)

Maleic anhydride was found to be corrosive to intact rabbit skin.

Data fall in "Toxic" category.

ACUTE DERMAL TOXICITY OF MALEIC ANHYDRIDE TO RABBITS

<u>Dose (mg kg)</u>	<u>Mortality Ratio</u>
4000	3/3
3170	3/3
2520	1/3
2000	0/3

TOXICITY DATA SHEET

COMPOUND: OXALIC ACID, 5% Solution

CODE: 267

CLASSIFICATION:

TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ****	SYS. **	REF.
Man			
male	475	LD50	
Rat female	375	LC50	
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	20,000	Not Lethal	
2.	Rabbit	Dermal	-	Noncorrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

*** Dose in mg/Kg

**** Dose in ml/Kg

JUSTIFICATION:

267

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat Oral LD₅₀: Male 9.5 ml/kg
(Single Dose) 95% confidence limits (5.4-12.3)

Female 7.5 ml
95% confidence limits (5.0-11.0)

Rabbit 14-Day Dermal LD₅₀: Could not be calculated.
(24-Hour Skin Contact) No deaths occurred after skin exposure to 20 g/kg dose.

A 5% aqueous solution of oxalic acid was found to be noncorrosive to intact rabbit skin.

Data fall in "Toxic" category.

ACUTE ORAL TOXICITY OF 5% OXALIC ACID TO RATS

Male		Female	
<u>Dose (mg kg)</u>	<u>Mortality Ratio</u>	<u>Dose (mg kg)</u>	<u>Mortality Ratio</u>
32	5/5	32	5/5
16	4/5	16	5/5
8	2/5	8	3/5
4	0/5	4	0/5

TOXICITY DATA SHEET

COMPOUND: 3-METHYLBUTYRIC ACID
(Isovaleric Acid)

CODE: 270

CLASSIFICATION: TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	3560	LD50	
2.					
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

270

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rabbit 14-day Dermal LD₅₀: 3560 mg/kg
95% confidence limits (1880-6770)

3-Methylbutyric acid was found to be noncorrosive to intact rabbit skin.

Data fall in "Toxic" category.

ACUTE DERMAL TOXICITY OF 3-METHYLBUTYRIC ACID
TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
8000	3/3
4000	2/3
2000	0/3

TOXICITY DATA SHEET

COMPOUND: TRIS-2-HYDROXYETHYLISOCYANURATE CODE: 271

CLASSIFICATION: TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
male	20,000	0/5 - Mort. Ratio	
Rat female	20,000	3/5 - Mort. Ratio	
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	20,000	0/3 - Mort. Ratio	
2.	Rabbit	Dermal	-	Noncorrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

271

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Oral Toxicity: Oral doses of 20,000 mg/kg of tris-2-hydroxyethylisocyanurate were given to albino rats. No male rats died at this maximum achievable dose while only 3 of 5 female rats died. Calculation of LD₅₀ values cannot be performed.

Dermal Toxicity: Dose of 20,000 mg/kg placed on the skin of albino rabbits was not lethal. These amounts of 70-75 grams of the compound did not produce any erythema or skin corrosion.

Data fall in "Below Toxic" category.

TOXICITY DATA SHEET

COMPOUND: p-CRESOL
(98+%, Sherwin-Williams)

CODE: 273

CLASSIFICATION. HIGHLY TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man	_____	_____	_____
Rat	_____	_____	_____
Mouse	_____	_____	_____
Dog	_____	_____	_____
Monkey	_____	_____	_____
Other	_____	_____	_____

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man	_____	_____	_____
Rat	_____	_____	_____
Mouse	_____	_____	_____
Dog	_____	_____	_____
Monkey	_____	_____	_____
Cat	_____	_____	_____
Guinea Pig	_____	_____	_____
Other	_____	_____	_____

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.	Rabbit	Dermal	174	LD ₅₀	
2.	Rabbit	Dermal	-	Corrosive	
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

273

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rabbit 14-Day Dermal LD₅₀: 174 mg/kg
(24-Hour Skin Contact) 95% confidence limits (120-270)

Para cresol was found to be corrosive to intact rabbit skin.

Data fall in "Highly Toxic" category.

ACUTE DERMAL TOXICITY OF p-CRESOL (SHERWIN-WILLIAMS)
TO RABBITS

<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
500	2/3
250	2/3
125	1/3

TOXICITY DATA SHEET

COMPOUND: NITROGEN TRIFLUORIDE

CODE: 285

CLASSIFICATION: TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat 1-Hr	19,430 (6700)	LC ₅₀	285.1
Mouse 1-Hr	21,750 (7500)	LC ₅₀	285.1
Dog 1-Hr	27,840 (9600)	ALC ₅₀	285.1
Monkey 1-Hr	29,000 (10,000)	ALC ₅₀	285.1
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.					
2.					
3.					
4.					
5.					
6.					

* Concentration in mg/M³. Parenthetical values are ppm.

** System for expression of toxicity

*** Dose in mg/Kg

JUSTIFICATION:

285

Data fall in "Toxic" category.

REFERENCES:

- 285.1 Vernot, E. H., C. C. Haun, J. D. MacEwen and G. F. Egan, Toxicol. and App. Pharmacol., 26:1, 1973.

TOXICITY DATA SHEET

COMPOUND: PHOSPHOTUNGSTIC ACID

CODE: 287

CLASSIFICATION.

TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man			
Rat			
Mouse			
Dog			
Monkey			
Other			

ORAL TOXICITY

SPECIES	DOSE ***	SYS. **	REF.
Man			
male	3297	LD50	
Rat female	4925	LD50	
Mouse			
Dog			
Monkey			
Cat			
Guinea Pig			
Other			

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE ***	SYS. **	REF.
1.					
2.					
3.					
4.					
5.					
6.					

* Concentration in mg/M³

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

287

Data generated under contract between the Department of Transportation and the United States Air Force Toxic Hazards Laboratory.

Rat Oral LD₅₀: Male - 3297 mg/kg
(Single Dose) 95% confidence limits (2558-4249)

Female - 4925 mg/kg
95% confidence limits (3577-6780)

Data fall in "Toxic" category.

ACUTE ORAL TOXICITY OF PHOSPHOTUNGSTIC ACID TO RATS

Male		Female	
<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>	<u>Dose (mg/kg)</u>	<u>Mortality Ratio</u>
4000	4/5	8000	5/5
3175	2/5	4000	1/5
2520	1/5	2000	0/5

TOXICITY DATA SHEET

COMPOUND: SILICON TETRAFLUORIDE

CODE: 291

CLASSIFICATION: TOXIC

INHALATION TOXICITY

SPECIES	CONC. *	SYS. **	REF.
Man	_____	_____	_____
Rat	3919 (922)	LC50	.1
Mouse	_____	_____	_____
Dog	_____	_____	_____
Monkey	_____	_____	_____
Other	_____	_____	_____

ORAL TOXICITY

SPECIES	DOSE***	SYS. **	REF.
Man	_____	_____	_____
Rat	_____	_____	_____
Mouse	_____	_____	_____
Dog	_____	_____	_____
Monkey	_____	_____	_____
Cat	_____	_____	_____
Guinea Pig	_____	_____	_____
Other	_____	_____	_____

OTHER ROUTES OF ADMINISTRATION

	SPECIES	ROUTE	DOSE***	SYS. **	REF.
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____

* Concentration in mg/M³. Parenthetical values are ppm.

** System for expression of toxicity

***Dose in mg/Kg

JUSTIFICATION:

291

Data fall in "Toxic" category.

REFERENCES:

Scheel, L. D., W. C. Lane and W. E. Coleman, Amer. Ind. Hyg. Assoc. J.,
29:41. 1968

APPENDIX B
IDENTIFICATION OF CHEMICALS TESTED

<u>Chemical</u>	<u>Purity</u>	<u>Source</u>	<u>Lot Number</u>
Perchloromethyl- mercaptan	Practical	Eastman	A7A
Boron Trichloride	CP	Matheson	-
Boron Trifluoride	CP	Matheson	-
Ethyl Chloroformate	BP 92-93 C	Baker	322609
Hexamethylene Diamine	Practical	Baker	2-3542
Methyl Chloroformate	Practical	MCB	MX 860-500
Nitric Acid	Reagent	Mallinkrodt	ATX
n-Butyl Acrylate	-	MCB	BX 1765-1
Methyl Acrylate	Practical	MCB	18
Monoethanolamine	MP 10-12 C	Baker	315606
Phenol (Solid)	Reagent, ACS	MCB	510
Propionic Acid	BP 140-142 C	Baker	404002
Hydrochloric Acid	Analytical Reagent	Mallinkrodt	WBD P
Sodium Hydroxide	Reagent	MCB	406907
Sulfuric Acid	Reagent	Baker	321040
Hydrofluoric Acid	52%	Mallinkrodt	BEE
Ethyl Mercaptan	Baker	Baker	308901
Cresol (Coal Tar	NF	Koppers	7580151
Cresol (Petroleum)	USP	Productol	9398

<u>Chemical</u>	<u>Purity</u>	<u>Source</u>	<u>Lot Number</u>
o-Cresol	Practical	MCB	34
m-Cresol	Practical	MCB	29
p-Cresol	Practical	MCB	11
Sodium Trichloro-s-Triazinetrione	Technical	Monsanto	KD 095151
Fumaric Acid	99+%	MCB	A 11 E 22
Maleic Anhydride	MP 53-55 C	MCB	48
Ammonium Hydroxide	Reagent ACS	B & A	D J11191
Oxalic Acid	Technical	MCB	26
Sodium Sulfide	Reagent	MCB	39
Sodium Sulfhydrate	Technical	MCB	30
3-Methylbutyric Acid	BP 174-176 C	MCB	VX-30
Tris-2-Hydroxyethyl-isocyanurate	-	Allied	Sample #5061
p-Cresol (Sherwin-Williams)	98%	Sherwin-Williams	CCA 5260
Potassium Hydroxide	Technical	Fisher	744243
Acetic Acid	Reagent ACS	City Chemical	EE 83-2
Gumout	Commercial	Pennzoil	7205
No. 7 Carburetor Cleaner	Commercial	DuPont	3711N
B-12 Chemtool	Commercial	Berryman	B-100
Phosphotungstic Acid	Reagent	MCB	23